

<b>Notice of Allowability</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/409,613	CHRISTOFFERSON ET AL..	
	<b>Examiner</b>	<b>Art Unit</b>	
	HUNG Q PHAM	2162	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment 09/17/2004.
2. ☒ The allowed claim(s) is/are 1,2,4-11,13-20,22-39,41,43 and 45.
3. ☒ The drawings filed on 20 February 2003 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).


\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |   |  |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)  | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)                                |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date <u>011805</u> . |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment  |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance                       |
|   | 9. <input type="checkbox"/> Other _____.   |

  
**SHAHID ALAM**  
 PRIMARY EXAMINER

### EXAMINER'S AMENDMENT

- An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with applicant's representative, David Victor, on 01/15/2005.

- Replace claim 1 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 1) *A computer implemented method for processing an input file in a file system, wherein the input file has an input file name, comprising:*

*storing in cache memory a data structure generated by applying a hash function to all file names in the file system to determine integer values corresponding to the file names, wherein the hash function maps the input file names to integer values, wherein the data structure indicates those values corresponding to the file names to indicate all file names used in the file system, and wherein the data structure includes an entry for each possible integer value capable of being generated from the hash function;*

*applying the hash function to map the input file name to one integer value; and*

*scanning the data structure in cache memory without reading directory information from storage locations in a storage device to determine whether there is a preexisting file in the file system having a name that maps, according to the hash function, to the integer value to which the input file name maps, wherein two files that map to one integer value according to the hash function are capable of having a same name.*

- Replace claim 2 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

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(Claim 2) *The method of claim 1, wherein the mapped-to values require fewer bits of storage than the file names.*

- Cancel claim 3 in the amendment filed on 09/17/2004.

• Replace claim 4 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 4) *The method of claim 1, wherein processing the data structure to determine whether there is a preexisting file comprises determining whether the entry for the integer value to which the input file name maps indicates a presence of one preexisting file mapping to the integer value to which the input file name maps.*

• Replace claim 5 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 5) *The method of claim 4, wherein the data structure is a one-dimensional array and wherein each entry is capable of having one of two values, further comprising setting the entry to a first value if there is one preexisting file name in the file system that maps to the integer value for the entry, and wherein determining whether there is one preexisting file comprises determining whether the entry for the integer value to which the input file name maps has the first value.*

• Replace claim 6 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 6) *The method of claim 1, further comprising:*

*applying the hash function to each file name in the file system to map each file name to one integer value; and*

*indicating in the data structure, for each file name, that there is one preexisting file for the integer value to which the file name maps.*

- Replace claim 7 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 7) *The method of claim 6, wherein the input file is the subject of an access request, further comprising scanning each file in the file system to determine if there is at least one preexisting file having the input file name if there is one preexisting file in the file system having a name that maps, according to the hash function, to the integer value to which the input file name maps.*

- Replace claim 8 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 8) *The method of claim 7, wherein the access request to the input file is to add the input file as a new file to the file system, further comprising:*

*adding the input file as a new file to the file system if no preexisting file in the file system has the input file name; and*

*rejecting the access request if there is a preexisting file in the file system having the input file name.*

- Replace claim 9 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 9) *The method of claim 7, wherein the access request to the input file is to update a file in the file system with data from the input file, further comprising:*

*updating a preexisting file in the file system having the input file name with the data in the input file if there is such a preexisting file; and*

*rejecting the access request if there is no preexisting file in the file system having the input file name.*

- Replace claim 10 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 10) *A computer system for processing an input file in a file system, wherein the input file has an input file name, comprising:*

*means for storing in cache memory a data structure generated by applying a hash function to all file names in the file system to determine integer values corresponding to the file names, wherein the hash function maps the input file names to integer values, wherein the data structure indicates those values corresponding to the file names to indicate all file names used in the file system, and wherein the data structure includes an entry for each possible integer value capable of being generated from the hash function;*

*means for applying the function to map the input file name to one integer value; and*

*means for scanning the data structure in cache memory without reading directory information from storage locations in a storage device to determine whether there is a preexisting file in the file system having a name that maps, according to the hash function, to the integer value to which the input file name maps, wherein two files that map to one integer value according to the hash function are capable of having a same name.*

- Replace claim 11 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 11) *The system of claim 10, wherein the mapped-to values require fewer bits of storage than the file names.*

- Cancel claim 12 in the amendment filed on 09/17/2004.

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- Replace claim 13 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 13) *The system of claim 10, wherein the means for processing the data structure to determine whether there is a preexisting file comprises determining whether the entry for the integer value to which the input file name maps indicates a presence of one preexisting file mapping to the integer value to which the input file name maps.*

- Replace claim 14 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 14) *The system of claim 13, wherein the data structure is a one-dimensional array and wherein each entry is capable of having one of two values, further comprising setting the entry to a first value if there is one preexisting file name in the file system that maps to the integer value for the entry, and wherein determining whether there is one preexisting file comprises determining whether the entry for the integer value to which the input file name maps has the first value.*

- Replace claim 15 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 15) *The system of claim 10, further comprising:  
means for applying the hash function to each file name in the file system to map each file name to one integer value; and  
means for indicating in the data structure, for each file name, that there is one preexisting file for the integer value to which the file name maps.*

- Replace claim 16 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

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(Claim 16) *The system of claim 10, wherein the input file is the subject of an access request, further comprising means for scanning each file in the file system to determine if there is at least one preexisting file having the input file name if there is one preexisting file in the file system having a name that maps, according to the hash function, to the integer value to which the input file name maps.*

- Replace claim 17 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 17) *The system of claim 16, wherein the access request to the input file is to add the input file as a new file to the file system, further comprising:*

*means for adding the input file as a new file to the file system if no preexisting file in the file system has the input file name; and*

*means for rejecting the access request if there is a preexisting file in the file system having the input file name.*

- Replace claim 18 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 18) *The system of claim 16, wherein the access request to the input file is to update a file in the file system with data from the input file, further comprising:*

*means for updating a preexisting file in the file system having the input file name with the data in the input file if there is such a preexisting file; and*

*means for rejecting the access request if there is no preexisting file in the file system having the input file name.*

- Replace claim 19 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 19) *An article of manufacture for processing an input file in a file system, wherein the input file has an input file name, the article of manufacture comprising computer usable*

*media including at least one computer program embedded therein that causes the computer to perform:*

*storing in cache memory a data structure generated by applying a hash function to all file names in the file system to determine integer values corresponding to the file names, wherein the hash function maps the input file names to integer values, wherein the data structure indicates those values corresponding to the file names to indicate all file names used in the file system, and wherein the data structure includes an entry for each possible integer value capable of being generated from the hash function;*

*applying the hash function to map the input file name to one integer value; and*

*scanning the data structure in cache memory without reading directory information from storage locations in a storage device to determine whether there is a preexisting file in the file system having a name that maps, according to the hash function, to the integer value to which the input file name maps, wherein two files that map to one integer value according to the hash function are capable of having a same name.*

- Replace claim 20 in the amendment filed on 09/17/2004 by the clean

version (without underlined and crossed mark) amended by examiner as below:

(Claim 20) *The article of manufacture of claim 19, wherein the mapped-to values require fewer bits of storage than the file names.*

- Cancel claim 21 in the amendment filed on 09/17/2004.

- Replace claim 22 in the amendment filed on 09/17/2004 by the clean

version (without underlined and crossed mark) amended by examiner as below:

(Claim 22) *The article of manufacture of claim 19, wherein processing the data structure to determine whether there is a preexisting file comprises determining whether the entry for the integer value to which the input file name maps indicates a presence of one preexisting file mapping to the integer value to which the input file name maps.*



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- Replace claim 23 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 23) *The article of manufacture of claim 22, wherein the data structure is a one-dimensional array and wherein each entry is capable of having one of two values, further comprising setting the entry to a first value if there is one preexisting file name in the file system that maps to the integer value for the entry, and wherein determining whether there is one preexisting file comprises determining whether the entry for the integer value to which the input file name maps has the first value.*

- Replace claim 24 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 24) *The article of manufacture of claim 19, further comprising:  
applying the hash function to each file name in the file system to map each file name to one integer value; and  
indicating in the data structure, for each file name, that there is one preexisting file for the integer value to which the file name maps.*

- Replace claim 25 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 25) *The article of manufacture of claim 24, wherein the input file is the subject of an access request, further comprising scanning each file in the file system to determine if there is at least one preexisting file having the input file name if there is one preexisting file in the file system having a name that maps, according to the hash function, to the integer value to which the input file name maps.*

- Replace claim 26 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 26) *The article of manufacture of claim 25, wherein the access request to the input file is to add the input file as a new file to the file system, further comprising:*

*adding the input file as a new file to the file system if no preexisting file in the file system has the input file name; and*

*rejecting the access request if there is a preexisting file in the file system having the input file name.*

- Replace claim 27 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 27) *The article of manufacture of claim 25, wherein the access request to the input file is to update a file in the file system with data from the input file, further comprising:*

*updating a preexisting file in the file system having the input file name with the data in the input file if there is such a preexisting file; and*

*rejecting the access request if there is no preexisting file in the file system having the the input file name.*

- Replace claim 28 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 28) *The method of claim 1, further comprising:*

*searching the file system for one preexisting file having the input file name if the data structure indicates that one preexisting file has a name that maps, according to the hash function, to the integer value to which the input file maps; and*

*performing an operation if the file system includes one preexisting file having the input file name.*

- Replace claim 29 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 29) *The method of claim 28, wherein performing the operation comprises:*

*applying update data to the preexisting file having the input file name if the file system includes one preexisting file having the input file name.*

- Replace claim 30 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 30) *The method of claim 28, wherein the input file comprises a file to add to the file system, further comprising:*

*returning an error if the file system includes one preexisting file having the input file name; and*

*adding the input file to the file system if the file system does not include one preexisting file having the same name as the input file.*

- Replace claim 31 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 31) *The system method of claim 1, further comprising:*

*means for searching the file system for one preexisting file having the input file name if the data structure indicates that one preexisting file has a name that maps, according to the hash function, to the integer value to which the input file name maps; and*

*means for performing an operation if the file system includes one preexisting file having the input file name.*

- Replace claim 32 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 32) *The system of claim 31, wherein the means for performing the operation further performs:*

*applying update data to the preexisting file having the input file name if the file system includes one preexisting file having the input file name.*

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- Replace claim 33 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 33) *The system of claim 31, wherein the input file comprises a file to add to the file system, further comprising:*

*means for returning an error if the file system includes one preexisting file having the input file name; and*

*means for adding the input file to the file system if the file system does not include one preexisting file having the input file name.*

- Replace claim 34 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 34) *The article of manufacture of claim 19, further comprising:*

*searching the file system for one preexisting file having the input file name if the data structure indicates that one preexisting file has a name that maps, according to the hash function, to the integer value to which the input file name maps; and*

*performing an operation if the file system includes one preexisting file having the input file name.*

- Replace claim 35 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 35) *The article of manufacture of claim 34, wherein performing the operation comprises:*

*applying update data to the preexisting file having the input file name if the file system includes one preexisting file having the input file name.*

- Replace claim 36 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 36) *The article of manufacture of claim 34, wherein the input file comprises a file to add to the file system, further comprising:*

*returning an error if the file system includes one preexisting file having the input file name; and*

*adding the input file to the file system if the file system does not include one preexisting file having the input file name.*

- Replace claim 37 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 37) *The method of claim 1, wherein the hash function comprises a wide hash function to produce a large number of possible hash values to minimize the likelihood that the application of the hash function to file names in the file system would have a same hash value.*

- Replace claim 38 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 38) *The system of claim 10, wherein the hash function comprises a wide hash function to produce a large number of possible hash values to minimize the likelihood that the application of the hash function to file names in the file system would have a same hash value.*

- Replace claim 39 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 39) *The article of manufacture of claim 19, wherein the hash function comprises a wide hash function to produce a large number of possible hash values to minimize the likelihood that the application of the hash function to file names in the file system would have a same hash value.*

- Replace claim 41 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 41) *A computer implemented method for processing an input file in a file system, wherein the input file has an input file name, comprising:*

*providing a data structure generated by applying a hash function to all file names in the file system to determine integer values corresponding to the file names, wherein the hash function maps the input file names to integer values, wherein the data structure indicates those integer values corresponding to the file names to indicate all file names used in the file system, and wherein the data structure includes multiple columns for different directories in the file system to indicate file names in different directories of the file system;*

*applying the hash function to map the input file name to one integer value; and  
processing the data structure to determine whether there is a preexisting file in the file system having a name that maps, according to the hash function, to the integer value to which the input file name maps, wherein two files that map to one integer value according to the hash function are capable of having a same name.*

- Replace claim 43 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 43) *A computer system for processing an input file in a file system, wherein the input file has an input file name, comprising:*

*means for providing a data structure generated by applying a hash function to all file names in the file system to determine integer values corresponding to the file names, wherein the hash function maps the input file names to integer values, wherein the data structure indicates those integer values corresponding to the file names to indicate all file names used in the file system, and wherein the data structure includes multiple columns for different directories in the file system to indicate file names in different directories of the file system;*

*means for applying the hash function to map the input file name to one integer value;  
and*

*means for processing the data structure to determine whether there is a preexisting file in the file system having a name that maps, according to the hash function, to the integer value to which the input file name maps, wherein two files that map to one integer value according to the function are capable of having a same name.*

- Replace claim 45 in the amendment filed on 09/17/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 45) *An article of manufacture for processing an input file in a file system, wherein the input file has an input file name, the article of manufacture comprising computer usable media including at least one computer program embedded therein that causes the computer to perform:*

*providing a data structure generated by applying a hash function to all file names in the file system to determine values corresponding to the file names, wherein the hash function maps the input file names to integer values, wherein the data structure indicates those integer values corresponding to the file names to indicate all file names used in the file system, and wherein the data structure includes multiple columns for different directories in the file system to indicate file names in different directories of the file system;*

*applying the hash function to map the input file name to one integer value; and*

*processing the data structure to determine whether there is a preexisting file in the file system having a name that maps, according to the hash function, to the integer value to which the input file name maps, wherein two files that map to one integer value according to the hash function are capable of having a same name.*

### ***Allowable Subject Matter***

Claims 1, 2, 4-11, 13-20, 22-39, 41, 43 and 45 (renumbered as 1-39) are allowed.

The following is an examiner's statement of reasons for allowance:

The closest available prior arts, USP 6,535,867 B1, issued to Waters also teaches a method and system that computes a hash function based upon the file name that is to be identified in a look-up table stored in external memory. However, Waters fails to teach or suggest the steps of *storing in cache memory a data structure generated by applying a hash function to all file names in the file system to determine integer values corresponding to the file names, and scanning the data structure in cache memory without reading directory information from storage locations in a storage device to determine whether there is a preexisting file in the file system having a name that maps, according to the hash function, to the integer value to which the input file name maps, wherein two files that map to one integer value according to the hash function are capable of having a same name* as in claims 1, 10 (renumbered as 16), and 19 (renumbered as 25), and the steps of *providing a data structure generated by applying a hash function to all file names in the file system to determine integer values corresponding to the file names, wherein the data structure includes multiple columns for different directories in the file system to indicate file names in different directories of the file system, and processing the data structure to determine whether there is a preexisting file in the file system having a name that maps, according to the hash function, to the integer value to which the input file name maps, wherein two files that map to one integer value according to the hash function are capable of having a same name* as in claims 41 (renumbered as 37), 43 (renumbered as 38), and 45 (renumbered as 39). Therefore, the invention is allowable over the prior arts of record including the providing steps as indicated above.




**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HUNG Q PHAM whose telephone number is 571-272-4040. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JOHN E BREENE can be reached on 571-272-4107. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Examiner Hung Pham  
January 19, 2005

  
SHAHID ALAM  
PRIMARY EXAMINER